

# OREM CITY

## SEWER MASTER PLAN

City Council  
Meeting

March 8, 2016

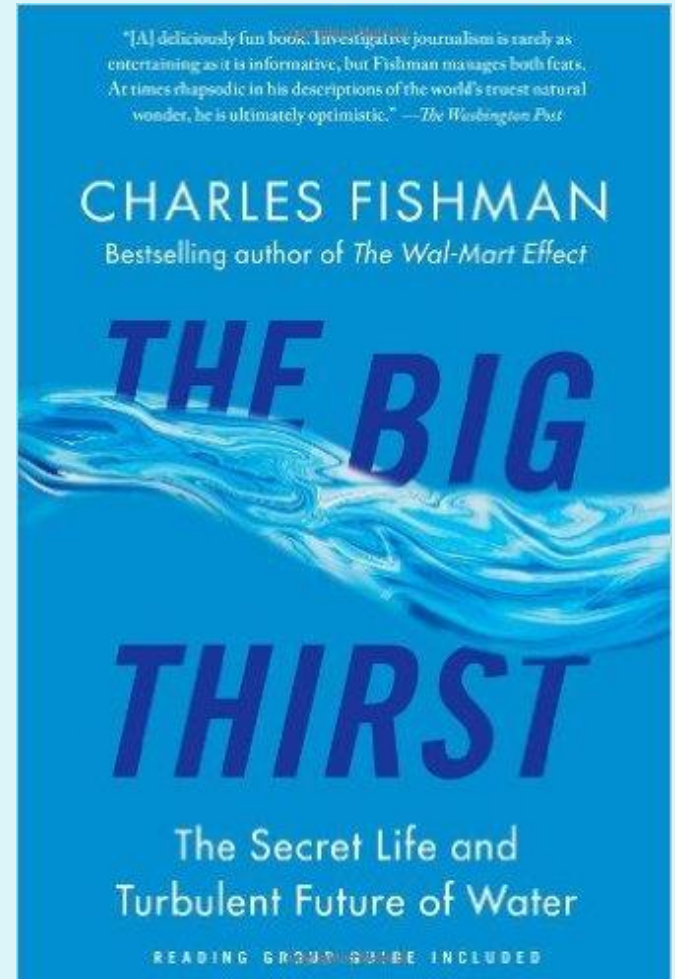


# TONIGHT'S OBJECTIVES

1. Approve the Sewer Master Plan
2. Recommend a Financial Plan

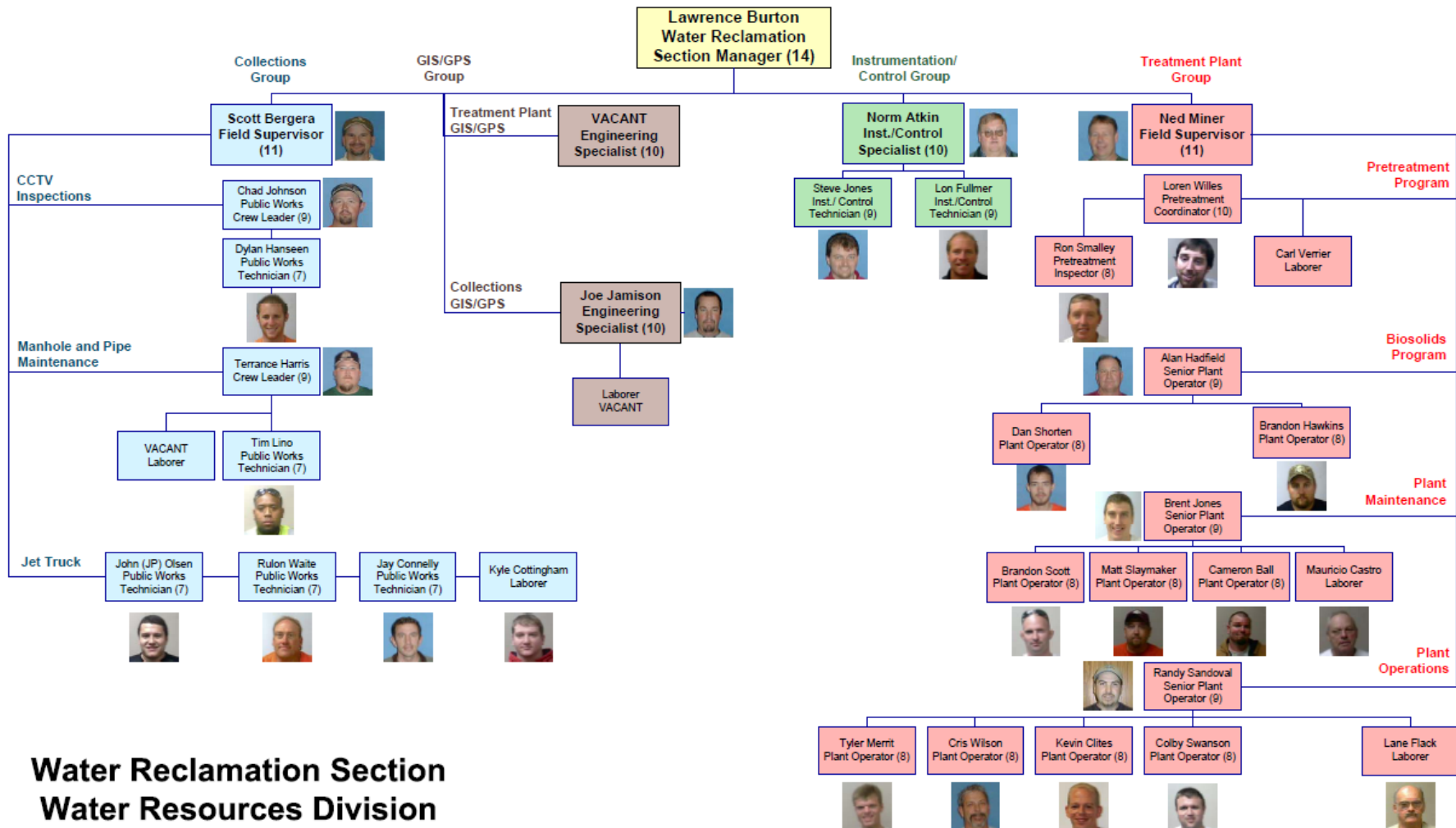
# WATER UTILITY CHALLENGES

- “The Big Thirst” Charles Fishman
- Visible Services vs. Invisible
  - Hypothesizes that the "invisibility" of water systems and prevalent philosophies on water being free (of cost) are its biggest vulnerabilities.



# THANKS

- Lawrence Burton, Water Reclamation Section Manager
- Water Reclamation Staff



**Water Reclamation Section  
Water Resources Division**

# SEWER UTILITY INFO

## How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

### Wastewater Treatment Protects the Environment

**E**very community produces liquid and solid wastes. The liquid portion—wastewater—is the water supply of the community after it has been used for a variety of purposes. Miles of pipe connect homes and businesses to the wastewater treatment plant to remove physical, chemical, and biological contaminants. The plant's objective is to produce a waste stream (or treated effluent) and solid waste (or sludge) suitable for discharge or for reuse back in the environment.

1. At the headworks, wastewater passes through screens to remove solid debris and floating material, such as rags, paper, plastics, and metals, that could cause problems later in the treatment process. Most of the removed materials are sent to a landfill.
2. Grit removal facilities eliminate sand, gravel, and other solid materials that are heavier than the organic biodegradable solids in the wastewater.
3. Motor control centers supply power to pumps required to move the wastewater to primary treatment. From here, gravity takes over to move the wastewater through the treatment process.
4. At the blower building, air is provided to the microorganisms in the aerobic treatment basins (7).
5. Primary settling tanks reduce the flow velocity and allow suspended material to settle to the bottom. Revolving "arms" simultaneously scrape the primary (untreated) solids from the bottom and skim the grease from the top. The solids receive further treatment as sludge.
6. Digesters process the sludge. Within the heated tanks, microscopic bacteria digest the sludge and break it down into stable organic matter, which can be reused in agricultural applications or in landfills.
7. Secondary effluent flows into aerobic treatment basins where bacteria break down contaminants even further.
8. Chlorination tanks kill disease-causing organisms before the water is released back into the environment. Dechlorination is generally necessary before the water is released.
9. The final effluent may be discharged to a stream, river, bay, lagoon, or wetland, or it can be used for irrigating a golf course, greenway, or park. If it's sufficiently clean, it can also be used for groundwater recharge.

*Illustration elements exaggerated for emphasis.*



# SEWER UTILITY INFO

## How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

### Wastewater Treatment Protects the Environment

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8. Chlorination tanks kill disease-causing organisms before the water is released back into the environment. Disinfection is generally necessary before the water is released.
9. The final effluent may be discharged to a stream, river, bay, lagoon, or wetland, or it can be used for irrigating a golf course, greenway, or park. If it's sufficiently clean, it can also be used for groundwater recharge.

Illustration elements exaggerated for emphasis.

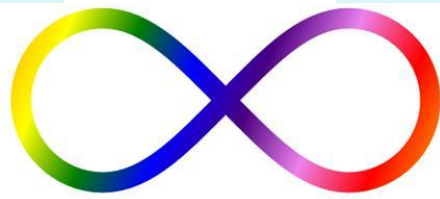
### ■ One of numerous unseen utilities

- Parks
- Recreation
- Library
- Police
- Fire
- Streets
- Traffic

# SEWER UTILITY INFO

## What Do You Expect???

- Reliable
- Become Clean
- Available
- Endless



# SEWER UTILITY INFO

Zoning and Building

Parks

Utopia

Traffic Signals  
and Signs

Storm Water

Recreation

Libraries

Police/  
Fire

Development

Water

Lighting

Senior Care



Sewer

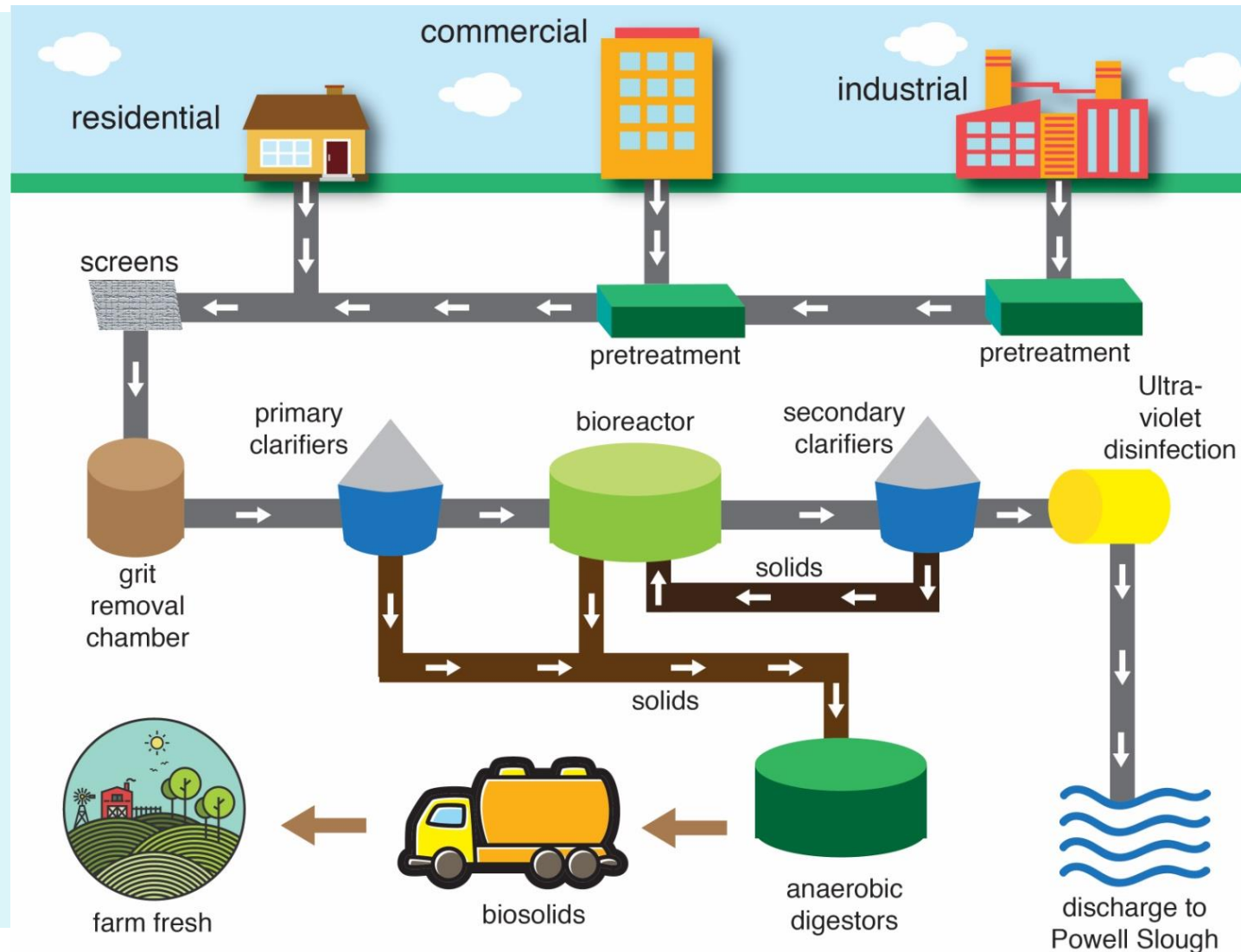
Roads



# OREM WATER RECLAMATION FACILITY (OWRF)



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# OREM WATER RECLAMATION FACILITY (OWRF)

- 1958
  - OWRF Constructed
- 1984
  - Oxidation Ditches
- 1994
  - Biosolids
- 1996
  - Aerobic Digester Covers
- 2000
  - Clarifier #7 and DAF
- 2001
  - Administration Building and Collection Shop
- 2012
  - BNR #3, Clarifier #8, and Thermophilic Digester
- 2014
  - Ultra-violet Disinfection



UTAH DEPARTMENT of  
ENVIRONMENTAL QUALITY  
**WATER  
QUALITY**





# OREM WATER RECLAMATION FACILITY (OWRF)

- 2.8 Billion Gallons Per Year
- Flow Never Stops
- 20,000 Samples Per Year
- 160 Pumps
- 130 Work Orders Per Week
- 1100+ Dry Metric Tons of Biosolids Per Year
  - Environmentally and Fiscally Responsibly Reused
- Pretreatment
  - 350 Permits
- High Tech SCADA and Monitoring Equipment
  - (Supervisory Control and Data Acquisition)
- Discharge to Powell Slough



UTAH DEPARTMENT of  
ENVIRONMENTAL QUALITY  
**WATER  
QUALITY**

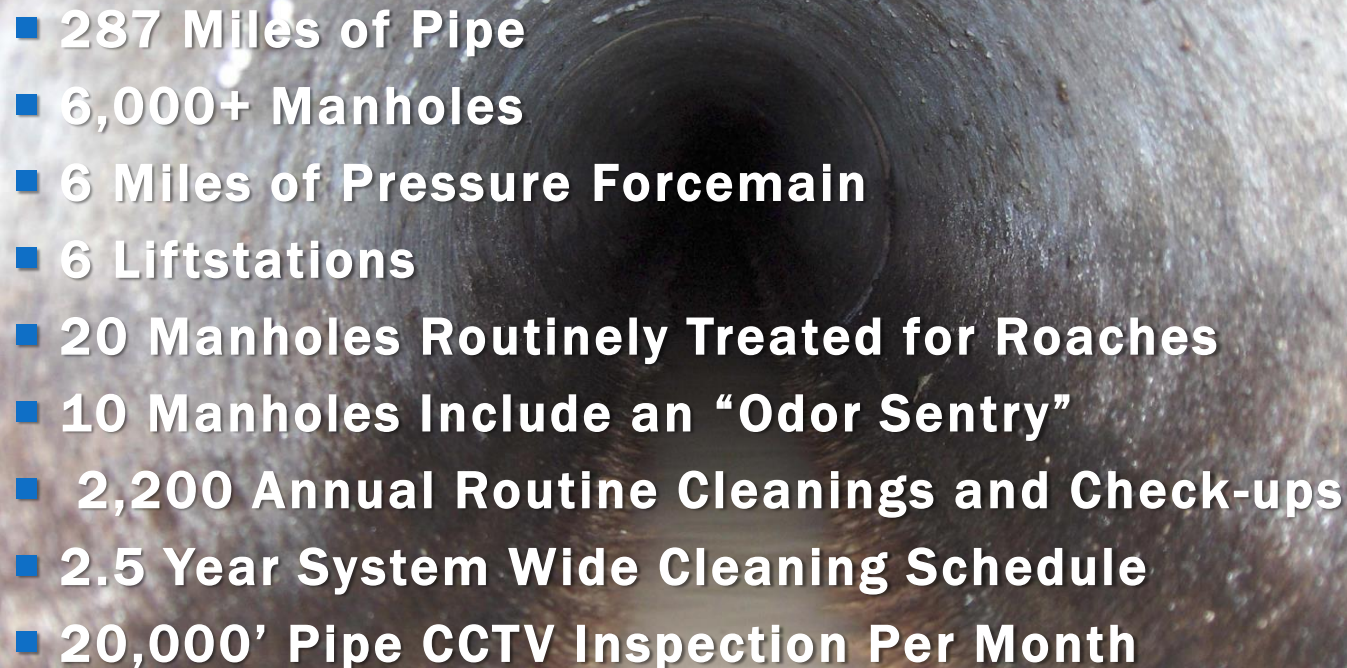


# OREM WATER RECLAMATION FACILITY (OWRF)





# COLLECTION SYSTEM

- 
- **287 Miles of Pipe**
  - **6,000+ Manholes**
  - **6 Miles of Pressure Forcemain**
  - **6 Liftstations**
  - **20 Manholes Routinely Treated for Roaches**
  - **10 Manholes Include an “Odor Sentry”**
  - **2,200 Annual Routine Cleanings and Check-ups**
  - **2.5 Year System Wide Cleaning Schedule**
  - **20,000’ Pipe CCTV Inspection Per Month**

# COLLECTION SYSTEM

**Table 2-1**  
**Sewer Collection System Sizes and Lengths**

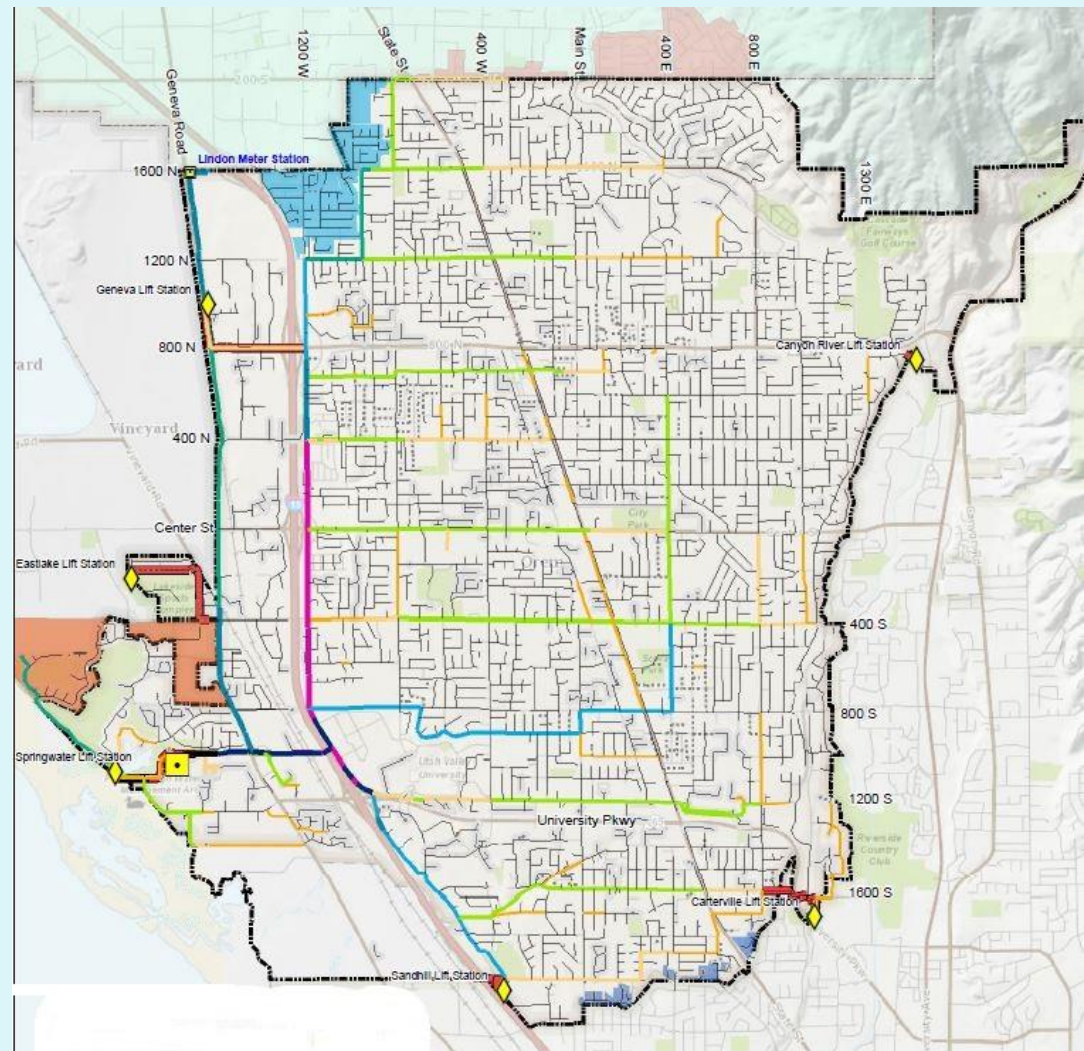
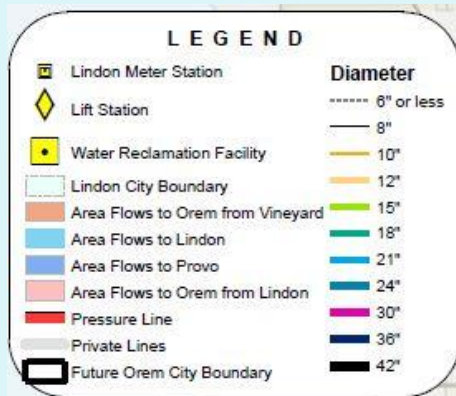
<b>Diameter</b>	<b>Length (ft)</b>	<b>Length (mi)</b>	<b>Percentage</b>
4*	3,982	0.75	0.3%
6	64,888	12.29	4.3%
8	1,193,295	226.00	78.9%
10	59,253	11.22	3.9%
12	43,472	8.23	2.9%
15	74,131	14.04	4.9%
18	18,182	3.44	1.2%
21	24,777	4.69	1.6%
24	12,040	2.28	0.8%
27	834	0.16	0.1%
30	9,495	1.80	0.6%
33	2,209	0.42	0.1%
36	3,169	0.60	0.2%
42	2,493	0.47	0.2%
<b>Total</b>	<b>1,512,219</b>	<b>286.41</b>	<b>100.0%</b>

\*service laterals are not included in the collection system lengths



# SEWER UTILITY

## EXISTING COLLECTION SYSTEM

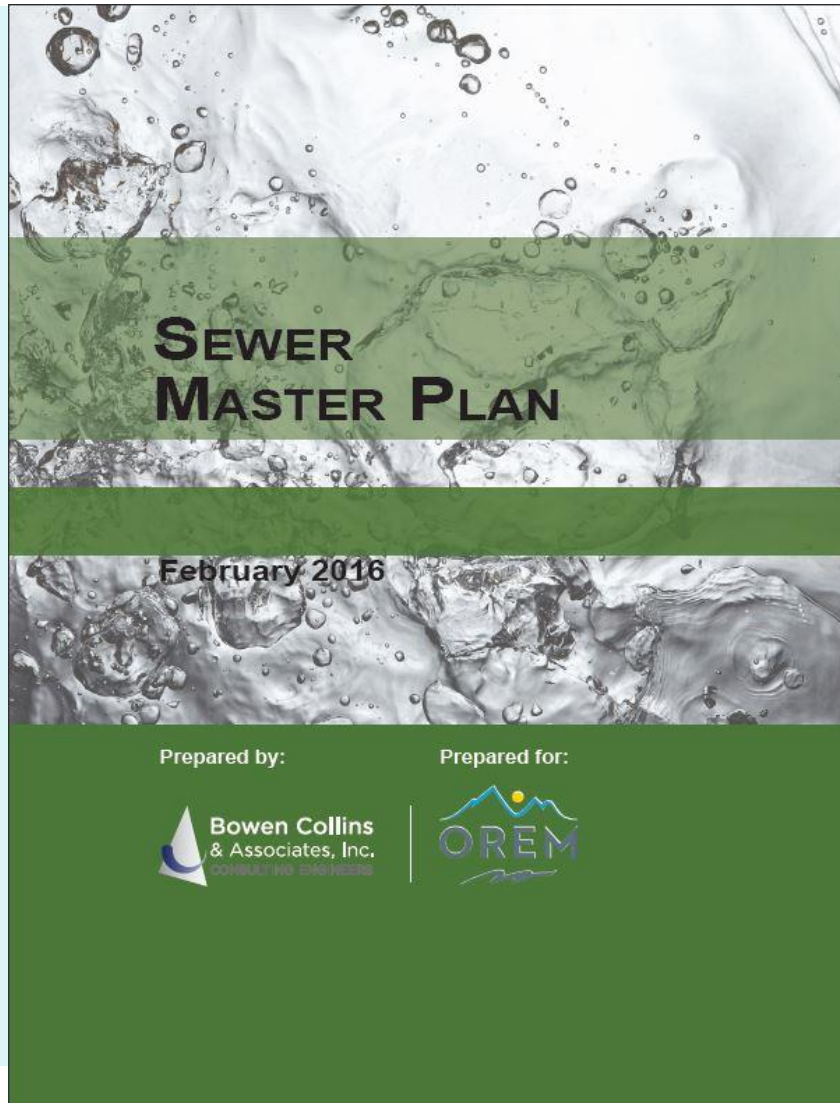


# PURPOSE OF MASTER PLAN

- Contracted with Bowen/Collins & Associates, Inc.
  - Provide recommended improvements to resolve existing and projected future deficiencies in the City's sewer system based on the adopted General Plan.
  - Conduct a Rate Study to recommend sewer rates for the City
  - A working document



# PURPOSE OF MASTER PLAN





# SCOPE OF PROJECT

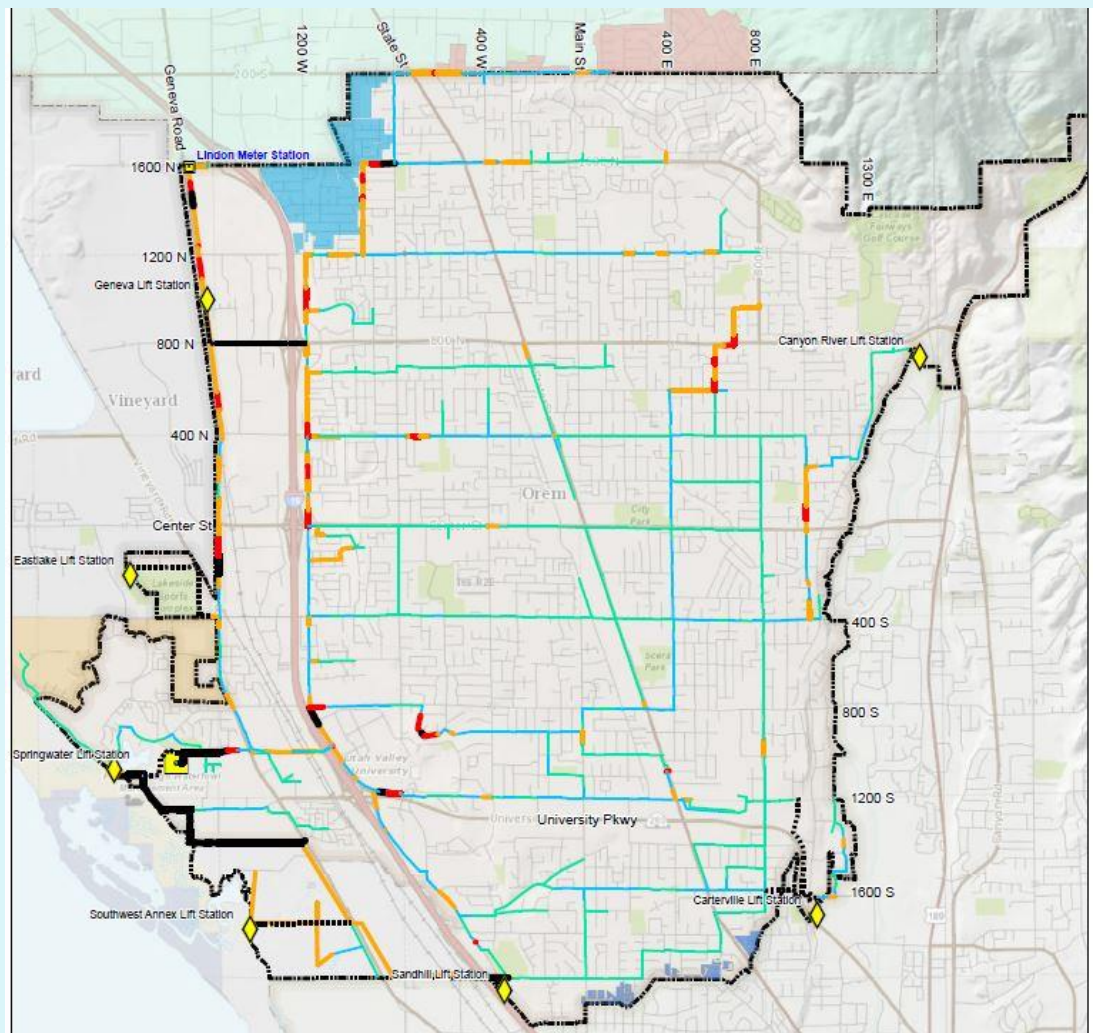
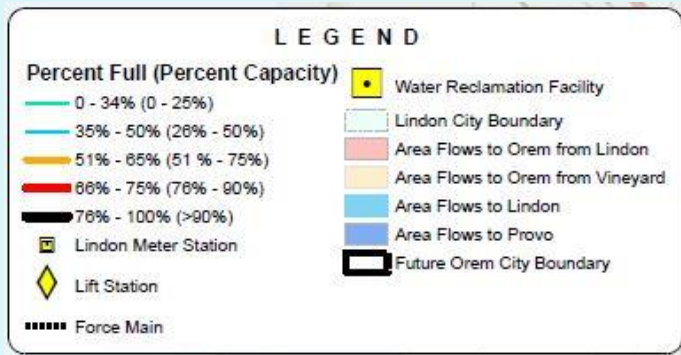
- **Conduct a thorough analysis of City's sewer utility system and its ability to meet the present and future sewer system needs.**
  - **Review**
    - Existing InfoSWMM model and OWRF needs.
    - Known deficiencies with city staff
  - **Collect**
    - Supplemental data to update model – water use data, sewer use patterns, etc.
  - **Modify**
    - Existing InfoSWMM model for future conditions
  - **Develop**
    - **Hydraulic model based on a existing, 15-year, and 40-year scenarios**
    - **Solutions to existing and future deficiencies and prioritize with staff**
    - **Solutions to struvite problems.**
    - **Utility rate options for the city.**
  - **Outreach**
    - Public Works Advisory Commission
    - Public open houses to communicate needs to the public
    - Mailers to city residents
    - Website with planning information
    - City Council work sessions and meetings

# PEAK FLOW AT BUILDOUT

**Table 3-4**  
**Projected Total Domestic Wastewater Flows**

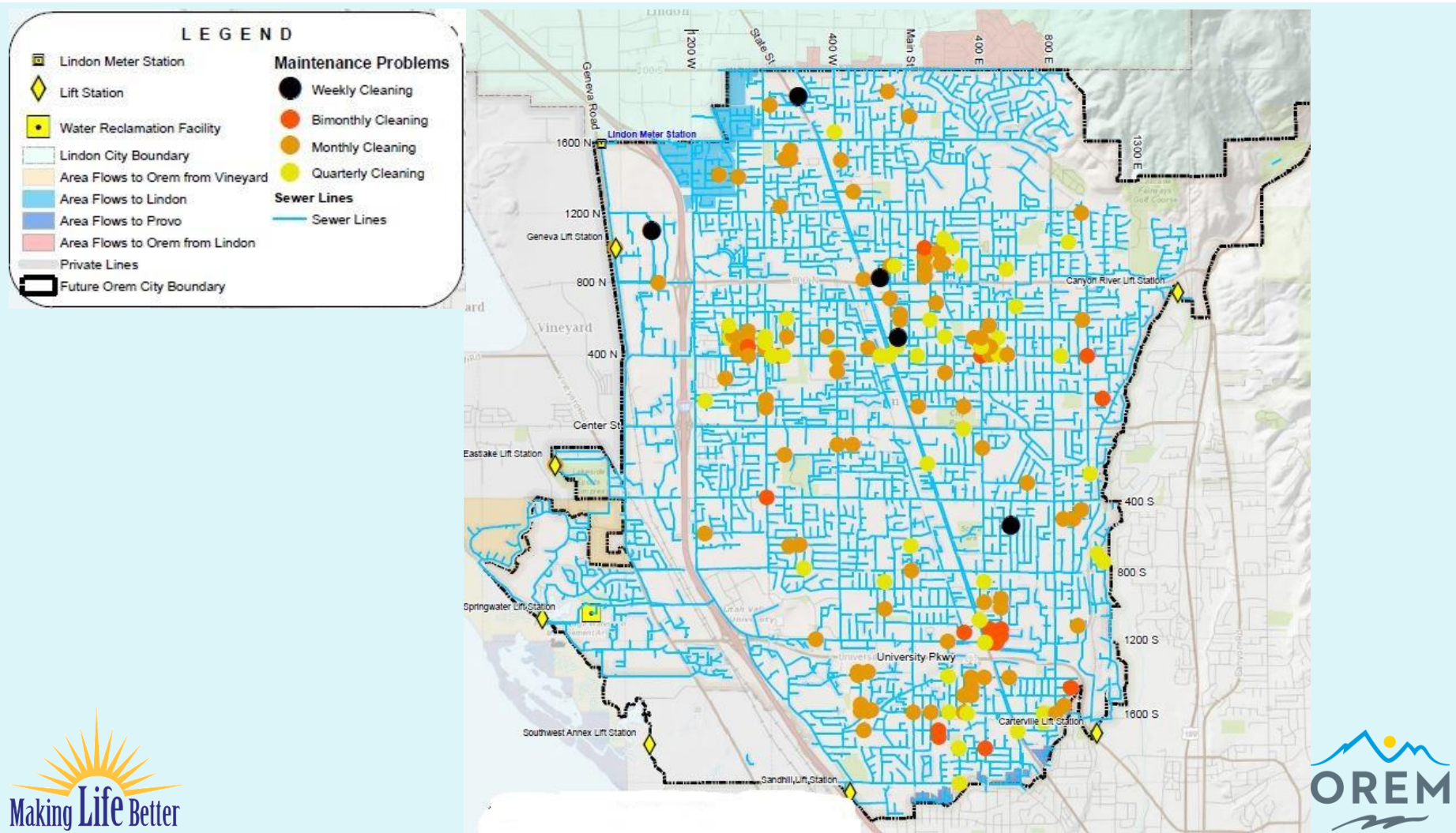
<b>Year</b>	<b>Residential Domestic Wastewater Flow (mgd)</b>	<b>Non-Residential Domestic Wastewater Flow (mgd)</b>	<b>UVU Domestic Wastewater Flow (mgd)</b>	<b>Total Domestic Wastewater Flow (mgd)</b>
2013	6.09	1.93	0.83	8.85
2020	6.71	2.14	1.14	9.99
2030	7.27	2.31	1.32	10.90
2040	7.90	2.43	1.43	11.76
2050	8.34	2.53	1.54	12.41
2060	8.70	2.64	1.65	12.99

# PEAK FLOW CONDITIONS AT BUILDOUT

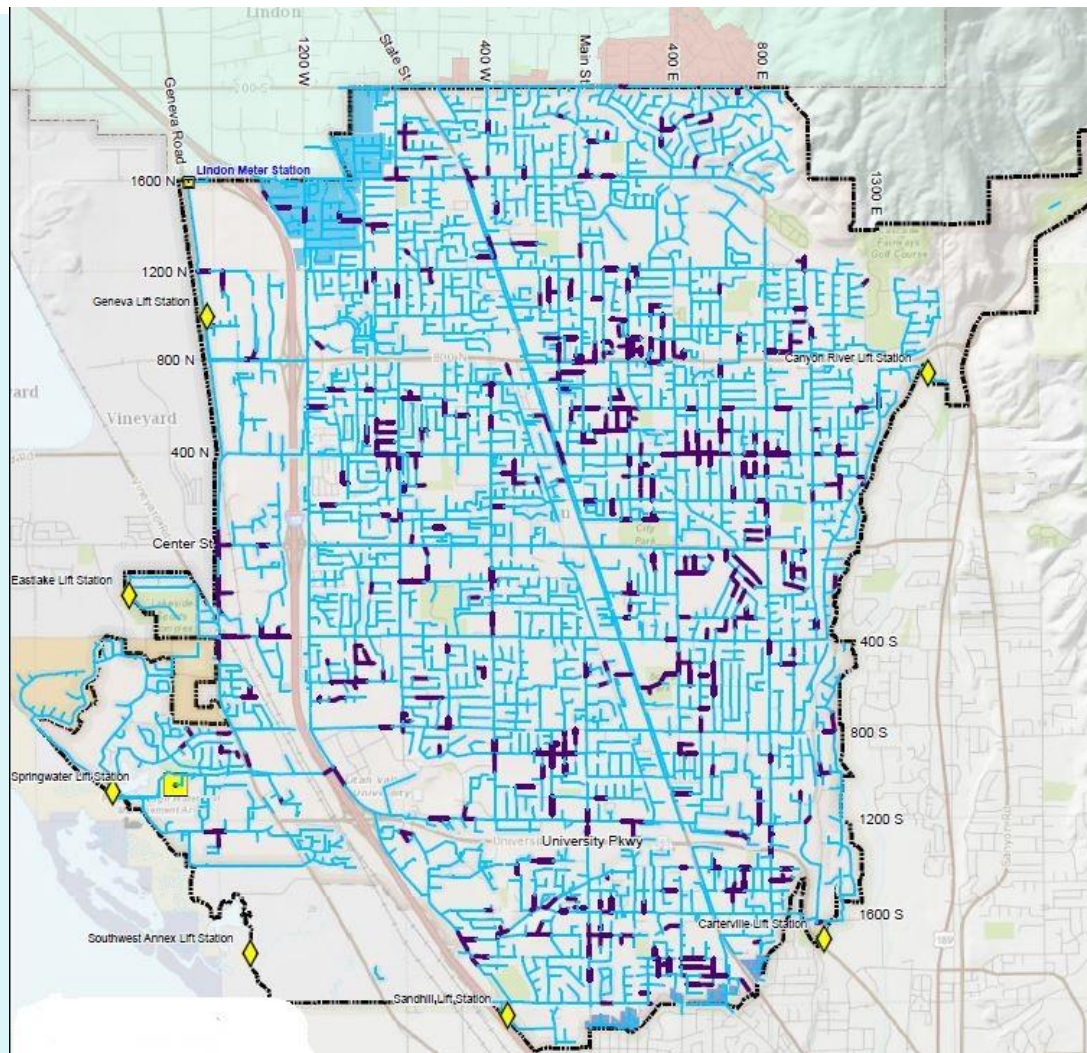




# ROUTINE MAINTENANCE AREAS

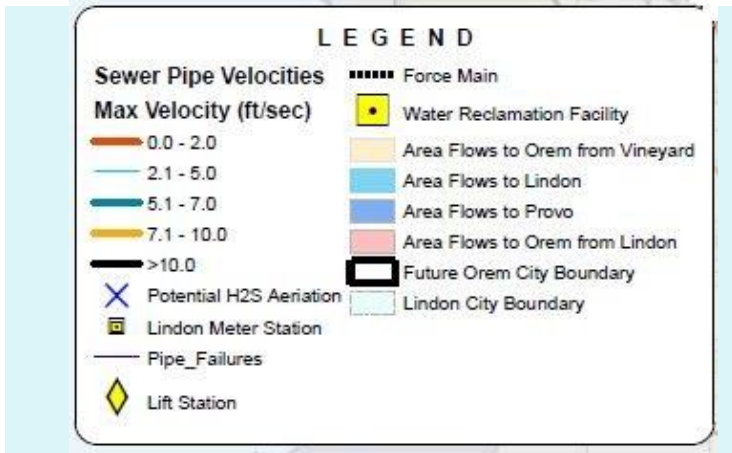


# ROUTINE MAINTENANCE PROJECTS

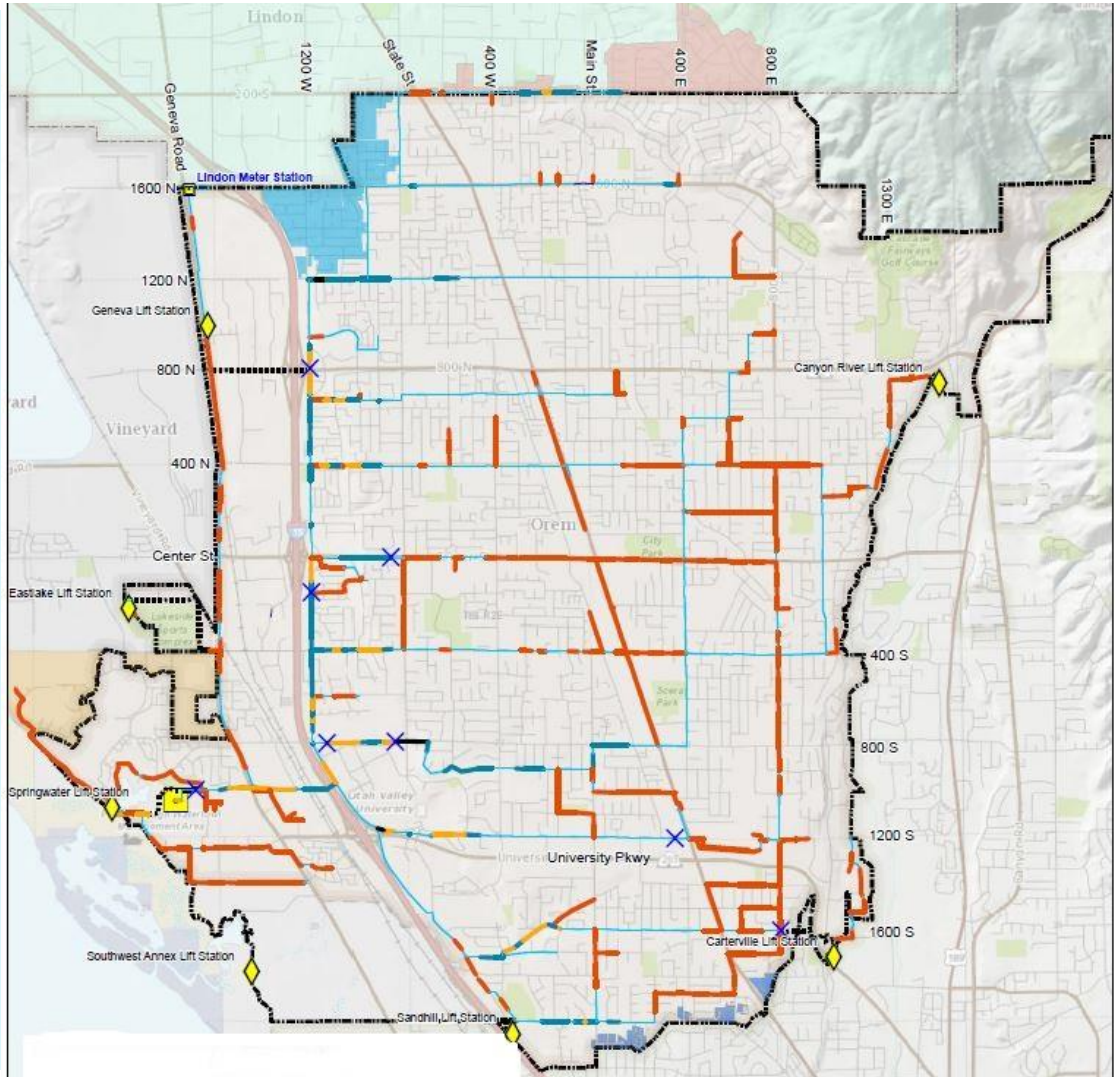




## H<sub>2</sub>S AERATION CONCERN AREAS



**Hydrogen Sulfide is generated at lift stations with infrequent cycles and sewer pipes with low velocities (less than 2 ft/sec).**



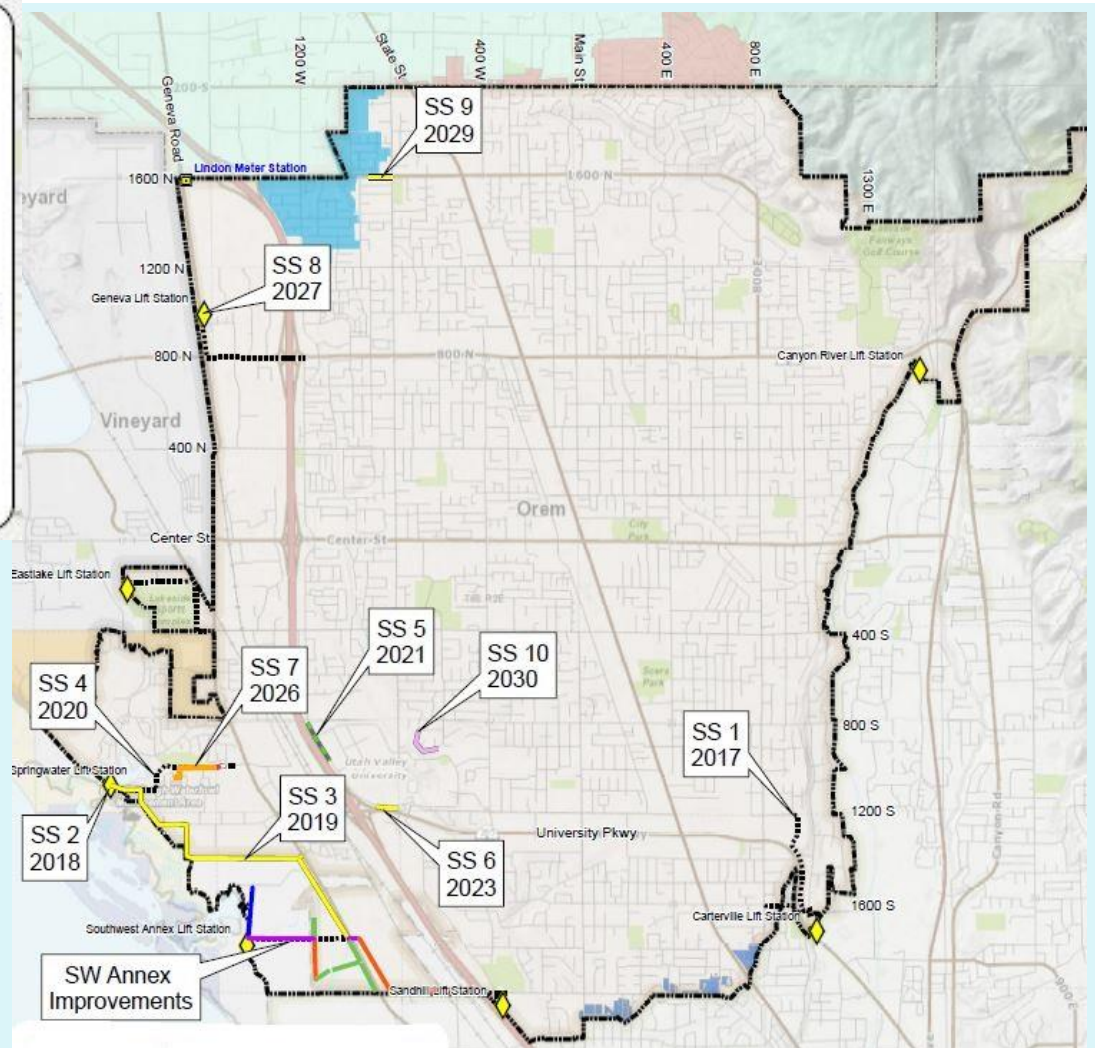
# FUTURE SYSTEM IMPROVEMENTS

## LEGEND

### Improvement Project Pipe Diameter

- 8 inch
- 10 inch
- 12 inch
- 15 inch
- 18 inch
- 21 inch
- 24 inch
- 27 inch
- 36 inch
- 42 inch
- 48 inch
- 54 inch

- Lindon Meter Station
- Lift Station
- Force Main
- Lindon City Boundary
- Area Flows to Orem from Lindon
- Future Orem City Boundary
- Area Flows to Orem from Vineyard
- Area Flows to Lindon
- Area Flows to Provo





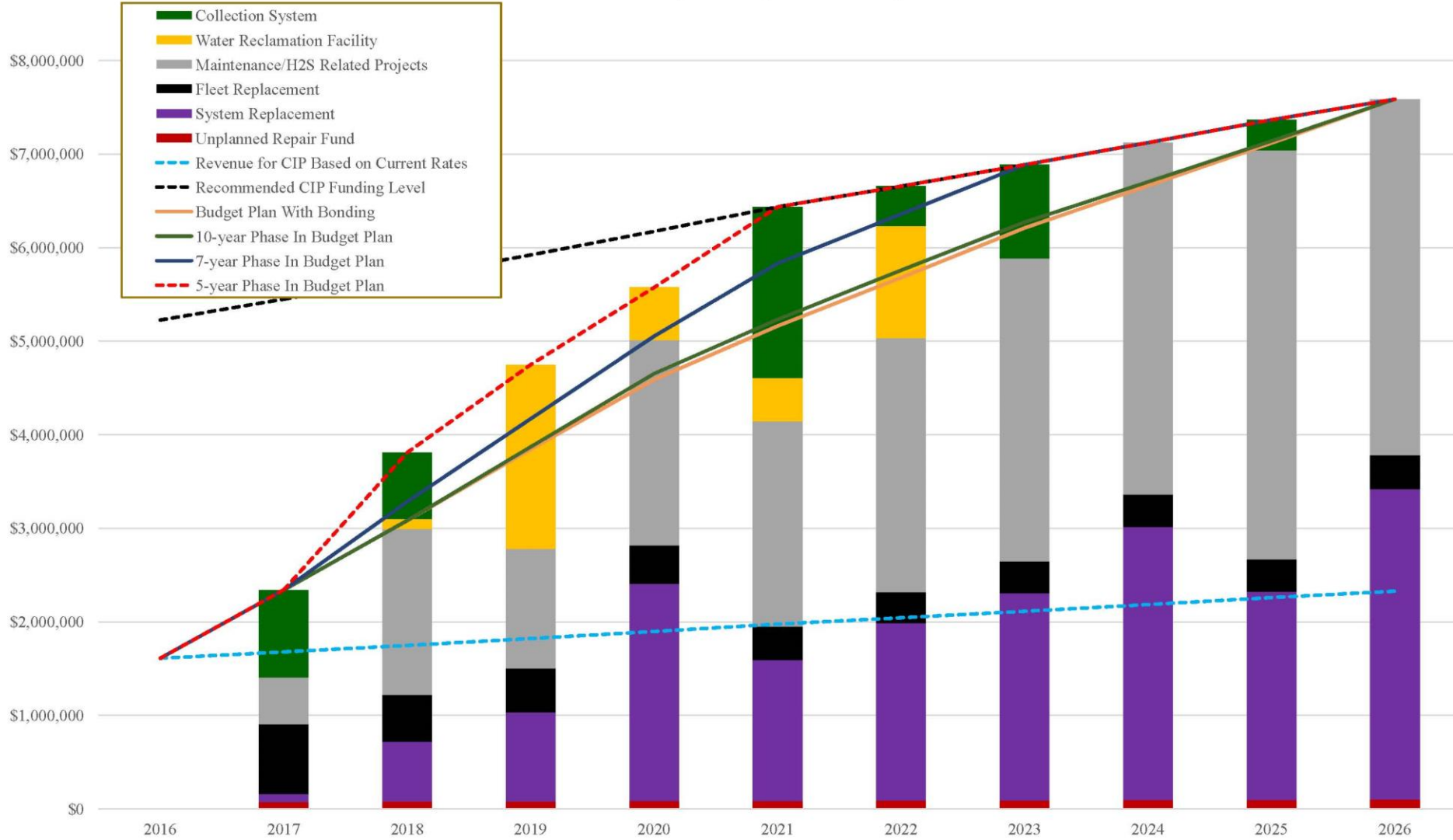
# TEN-YEAR CIP PLAN

## (BASED ON 5-YEAR FUNDING PROPOSAL)

Table 7-4  
10-Year Capital Improvement Plan – Scenario 1, 5-Year Phase In Plan

Project Identifier	Project Description	Estimated FY 2015 Total Cost	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
SS 1	Relocate Carterville force main to 1200 South	\$667,000		\$707,620								
SS 2	Upgrade/expand Springwater Lift Station	\$907,000	\$934,210									
SS 3	Replace 6850 feet of existing 10 inch line with 18 inch line in North SW Annex (Chambery to Springwater)	\$1,575,000					\$1,825,857					
SS 4	Install 2,700 feet 6 inch force main parallel to existing 10 inch force main from Springwater lift station	\$357,000						\$426,277				
SS 5	Replace 1260 feet of existing 27 inch/30 inch line with 36 inch line along College Drive at 800 South	\$813,000							\$999,887			
SS 6	Replace 820 feet of existing 12 inch pipe with 15 inch pipe along College Drive at 1200 South	\$249,000									\$324,889	
WRF 1	Replace screen washer	\$100,000		\$106,090								
WRF 2	Expand aeration basin in headworks	\$400,000					\$463,710					
WRF 3	Replace grit washer	\$200,000			\$218,545							
WRF 4	Third press in solids handling	\$500,000				\$562,754						
WRF 5	Struvite elimination	\$1,600,000			\$1,748,363							
WRF 6	Concrete/membrane existing lagoons	\$500,000						\$597,026				
WRF 7	Replace back-up generator	\$500,000						\$597,026				
M 1	Frequent maintenance related projects	\$5,996,000		\$1,272,231	\$655,199	\$674,855	\$695,101	\$715,954	\$737,432	\$759,555	\$782,342	\$805,812
M 2	675 N. 1060 W. to 1200 W. - H2S Concern	\$55,000			\$60,100							
M 3	1720 S. 400 W. to Sand Hill Road - H2S Concern	\$60,000			\$65,564							
M 4	Eastwood Street - Replacement Project	\$200,000									\$260,955	
M 5	Westwood Street - Replacement Project	\$250,000									\$326,193	
M 6	H2S Rehabilitation Program	\$14,665,000	\$500,000	\$500,000	\$500,000	\$1,518,214	\$1,500,000	\$2,000,000	\$2,500,000	\$3,000,000	\$3,000,000	\$3,000,000
System Replacement	Replace system as needed	\$14,786,000	\$81,378	\$638,416	\$953,741	\$2,323,666	\$1,503,671	\$1,898,541	\$2,213,316	\$2,918,362	\$2,226,020	\$3,321,636
Repairs	Unplanned repair fund	\$750,000	\$77,250	\$79,568	\$81,955	\$84,413	\$86,946	\$89,554	\$92,241	\$95,008	\$97,858	\$100,794
Fleet Replacement	Fleet maintenance and replacement	\$3,666,000	\$746,980	\$504,780	\$464,748	\$410,469	\$360,272	\$332,064	\$342,026	\$348,271	\$347,335	\$358,318
	<b>TOTAL</b>	<b>\$48,796,000</b>	<b>\$2,339,818</b>	<b>\$3,808,706</b>	<b>\$4,748,215</b>	<b>\$5,574,372</b>	<b>\$6,435,555</b>	<b>\$6,656,442</b>	<b>\$6,884,902</b>	<b>\$7,121,196</b>	<b>\$7,365,592</b>	<b>\$7,586,560</b>

Figure 7-4  
Recommended Sewer Fund Expenditures, Scenario 1 - 5-year Phase In Plan

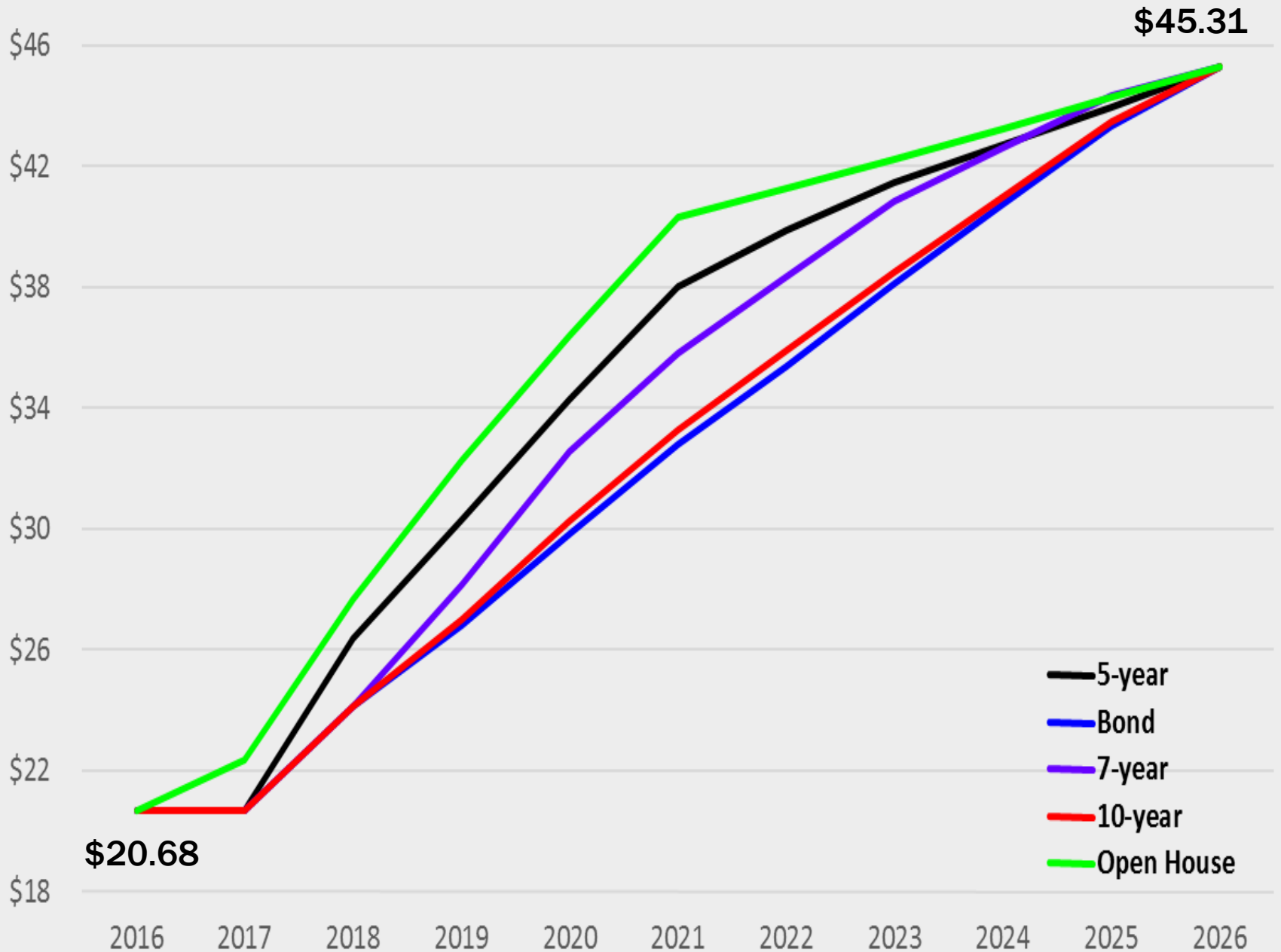


# SEWER UTILITY FUNDING

- Direction from City Council was
  - 5-year
  - 7-year
  - 10-year
  - Bonding



# Monthly Sewer Bill



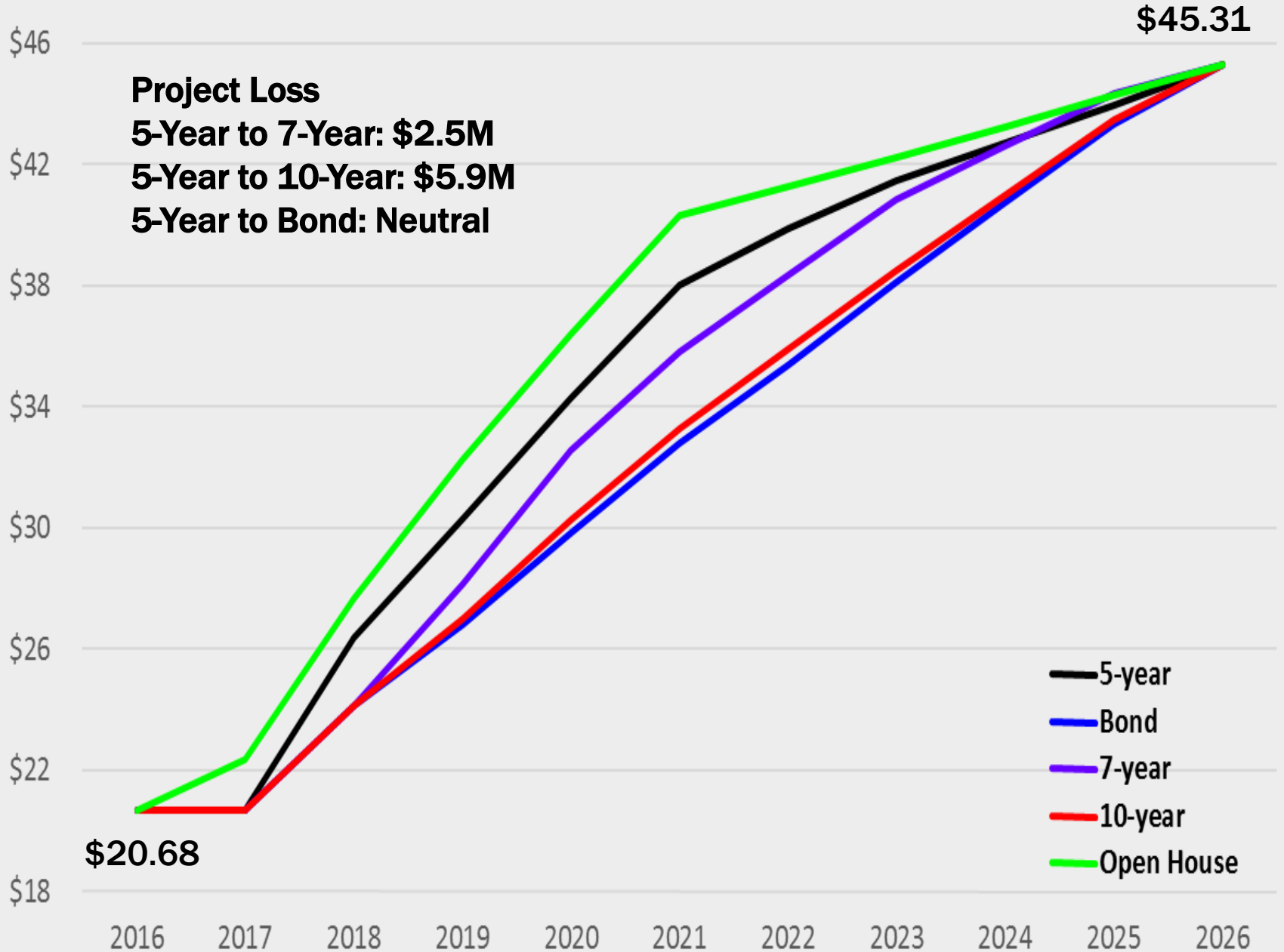
# Monthly Sewer Bill

## Project Loss

5-Year to 7-Year: \$2.5M

5-Year to 10-Year: \$5.9M

5-Year to Bond: Neutral



# TEN-YEAR CIP PLAN

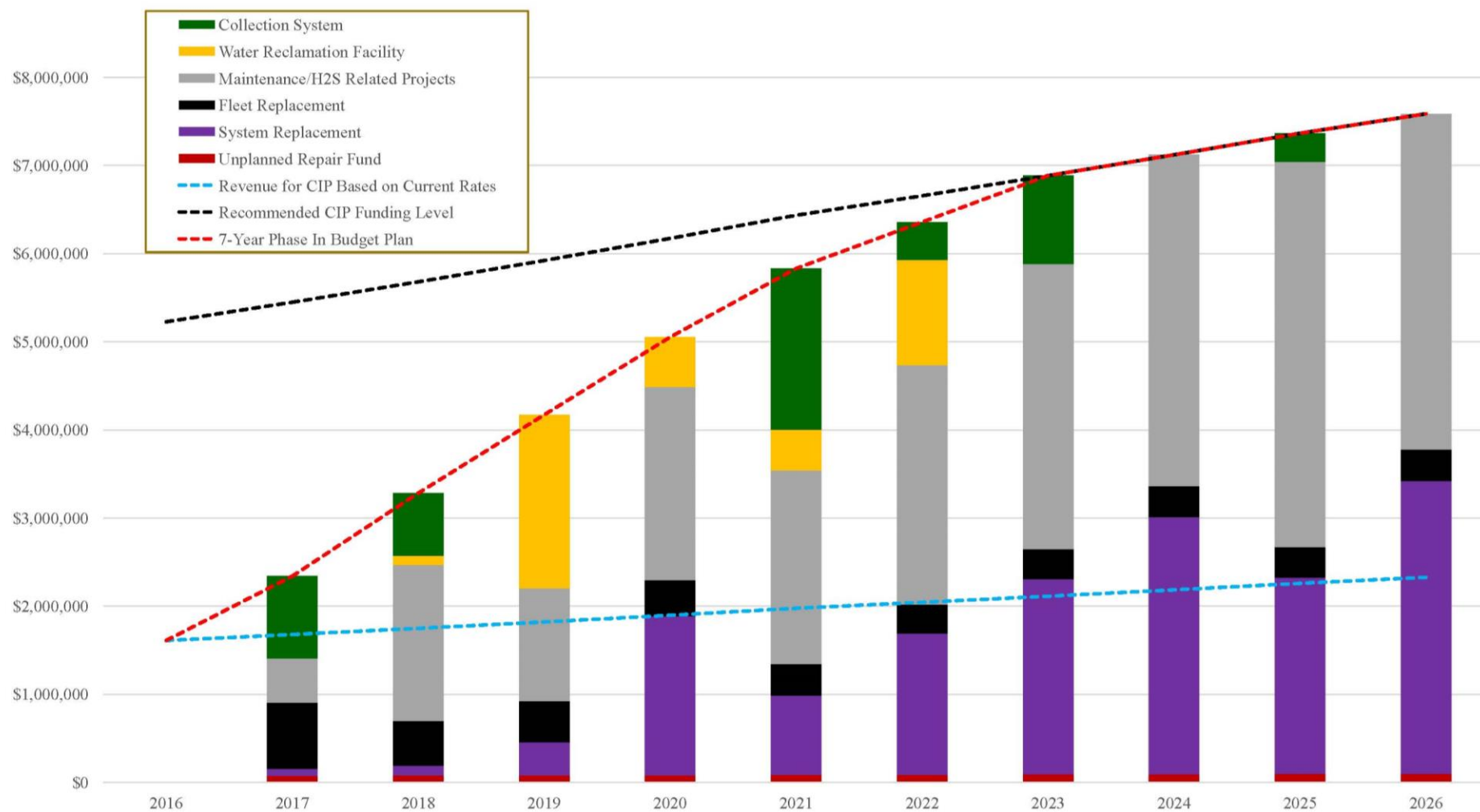
## (BASED ON 7-YEAR FUNDING PROPOSAL)

**Table 7-5**  
**10-Year Capital Improvement Plan – Scenario 2, 7-Year Phase In Plan**

Project Identifier	Project Description	Estimated FY 2015 Total Cost	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
SS 1	Relocate Carterville force main to 1200 South	\$667,000		\$707,620								
SS 2	Upgrade/expand Springwater Lift Station	\$907,000	\$934,210									
SS 3	Replace 6850 feet of existing 10 inch line with 18 inch line in North SW Annex (Chamberly to Springwater)	\$1,575,000					\$1,825,857					
SS 4	Install 2,700 feet 6 inch force main parallel to existing 10 inch force main from Springwater lift station	\$357,000						\$426,277				
SS 5	Replace 1260 feet of existing 27 inch/30 inch line with 36 inch line along College Drive at 800 South	\$813,000							\$999,887			
SS 6	Replace 820 feet of existing 12 inch pipe with 15 inch pipe along College Drive at 1200 South	\$249,000									\$324,889	
WRF 1	Replace screen washer	\$100,000		\$106,090								
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WRF 3	Replace grit washer	\$200,000			\$218,545							
WRF 4	Third press in solids handling	\$500,000				\$562,754						
WRF 5	Struvite elimination	\$1,600,000			\$1,748,363							
WRF 6	Concrete/membrane existing lagoons	\$500,000						\$597,026				
WRF 7	Replace back-up generator	\$500,000						\$597,026				
M 1	Frequent maintenance related projects	\$5,996,000		\$1,272,231	\$655,199	\$674,855	\$695,101	\$715,954	\$737,432	\$759,555	\$782,342	\$805,812
M 2	675 N. 1060 W. to 1200 W. - H2S Concern	\$55,000			\$60,100							
M 3	1720 S. 400 W. to Sand Hill Road - H2S Concern	\$60,000			\$65,564							
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M 5	Westwood Street - Replacement Project	\$250,000									\$326,193	
M 6	H2S Rehabilitation Program	\$14,665,000	\$500,000	\$500,000	\$500,000	\$1,518,214	\$1,500,000	\$2,000,000	\$2,500,000	\$3,000,000	\$3,000,000	\$3,000,000
System Replacement	Replace system as needed	\$12,528,000	\$81,378	\$112,604	\$375,818	\$1,802,622	\$900,000	\$1,600,000	\$2,213,316	\$2,918,362	\$2,226,020	\$3,321,636
Repairs	Unplanned repair fund	\$750,000	\$77,250	\$79,568	\$81,955	\$84,413	\$86,946	\$89,554	\$92,241	\$95,008	\$97,858	\$100,794
Fleet Replacement	Fleet maintenance and replacement	\$3,666,000	\$746,980	\$504,780	\$464,748	\$410,469	\$360,272	\$332,064	\$342,026	\$348,271	\$347,335	\$358,318
	<b>TOTAL</b>	<b>\$46,538,000</b>	<b>\$2,339,818</b>	<b>\$3,282,893</b>	<b>\$4,170,292</b>	<b>\$5,053,328</b>	<b>\$5,831,885</b>	<b>\$6,357,901</b>	<b>\$6,884,902</b>	<b>\$7,121,196</b>	<b>\$7,365,592</b>	<b>\$7,586,560</b>



Figure 7-5  
Recommended Sewer Fund Expenditures, Scenario 2 - 7-year Phase In Plan



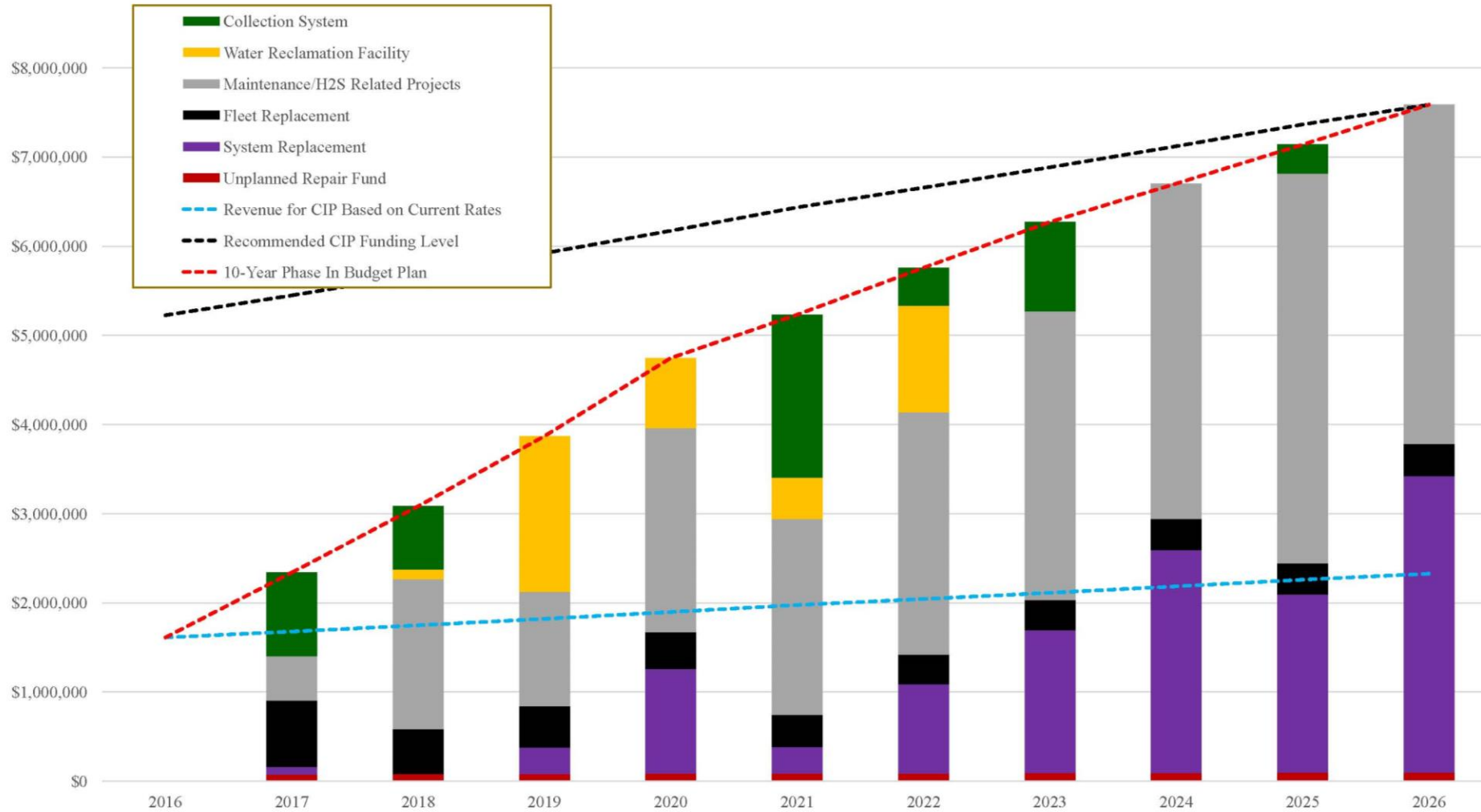
# TEN-YEAR CIP PLAN

## (BASED ON 10-YEAR FUNDING PROPOSAL)

Table 7-6  
10-Year Capital Improvement Plan – Scenario 3, 10-Year Phase In Plan

Project Identifier	Project Description	Estimated FY 2015 Total Cost	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
SS 1	Relocate Cartersville force main to 1200 South	\$667,000		\$707,620								
SS 2	Upgrade/expand Springwater Lift Station	\$907,000	\$934,210									
SS 3	Replace 6850 feet of existing 10 inch line with 18 inch line in North SW Annex (Chamberly to Springwater)	\$1,575,000					\$1,825,857					
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M 6	H2S Rehabilitation Program	\$14,665,000	\$500,000	\$412,604	\$500,000	\$1,611,624	\$1,500,000	\$2,000,000	\$2,500,000	\$3,000,000	\$3,000,000	\$3,000,000
System Replacement	Replace system as needed	\$9,770,000	\$81,378	\$0	\$294,364	\$1,177,520	\$300,000	\$1,000,000	\$1,600,000	\$2,500,000	\$2,000,000	\$3,321,636
Repairs	Unplanned repair fund	\$750,000	\$77,250	\$79,568	\$81,955	\$84,413	\$86,946	\$89,554	\$92,241	\$95,008	\$97,858	\$100,794
Fleet Replacement	Fleet maintenance and replacement	\$3,666,000	\$746,980	\$504,780	\$464,748	\$410,469	\$360,272	\$332,064	\$342,026	\$348,271	\$347,335	\$358,318
	<b>TOTAL</b>	<b>\$43,780,000</b>	<b>\$2,339,818</b>	<b>\$3,082,893</b>	<b>\$3,870,292</b>	<b>\$4,746,738</b>	<b>\$5,231,885</b>	<b>\$5,757,901</b>	<b>\$6,271,586</b>	<b>\$6,702,834</b>	<b>\$7,139,571</b>	<b>\$7,586,560</b>

Figure 7-6  
Recommended Sewer Fund Expenditures, Scenario 3 - 10-year Phase In Plan





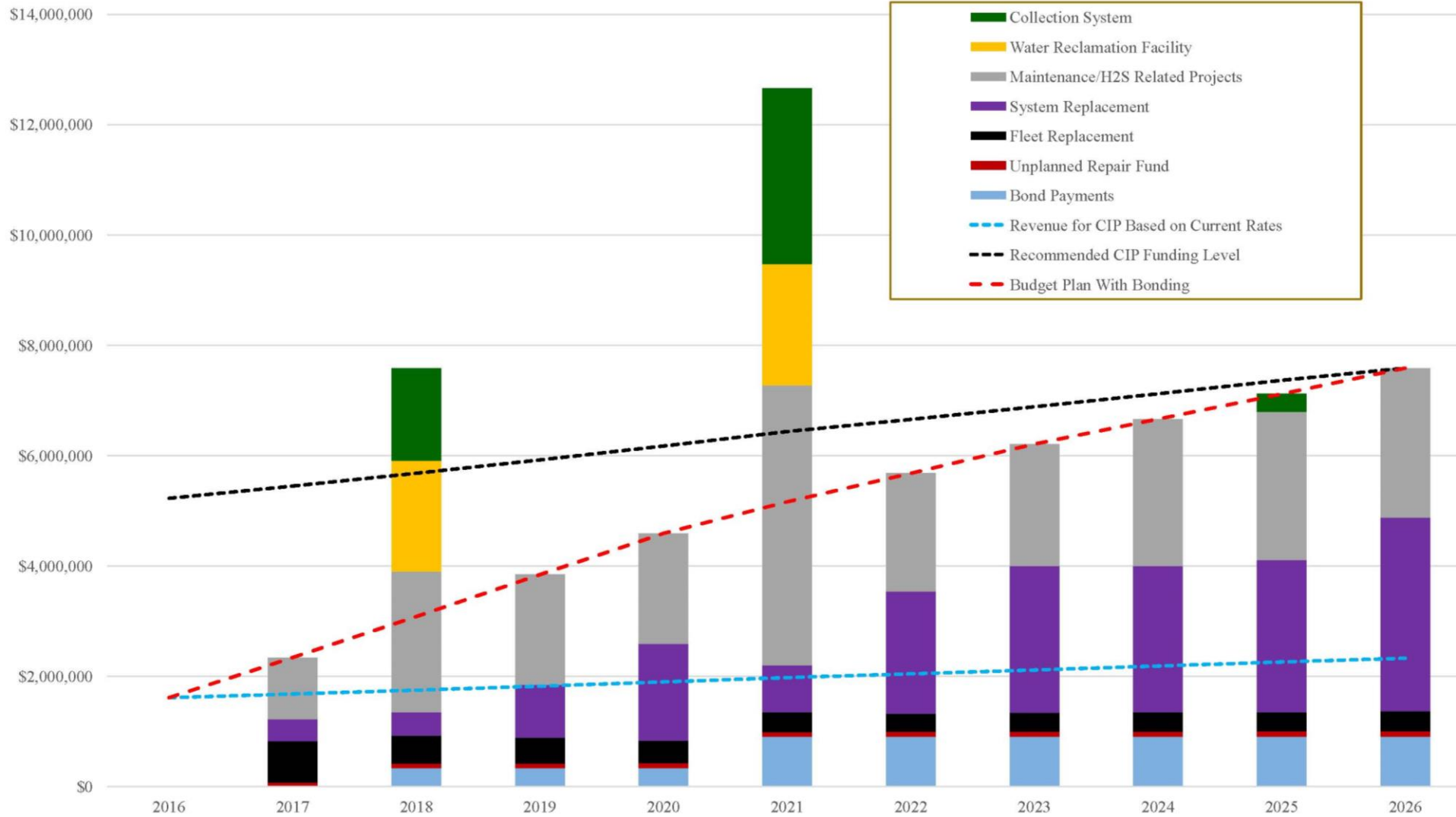
# TEN-YEAR CIP PLAN

## (BASED ON BONDING PROPOSAL)

Table 7-7  
10-Year Capital Improvement Plan – Scenario 4, With Bonding

Project Identifier	Project Description	Estimated FY 2015 Total Cost	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
SS 1	Relocate Cartersville force main to 1200 South	\$667,000		\$707,620								
SS 2	Upgrade/expand Springwater Lift Station	\$907,000		\$962,236								
SS 3	Replace 6850 feet of existing 10 inch line with 18 inch line in North SW Annex (Chambery to Springwater)	\$1,575,000					\$1,825,857					
SS 4	Install 2,700 feet 6 inch force main parallel to existing 10 inch force main from Springwater lift station	\$357,000					\$413,861					
SS 5	Replace 1260 feet of existing 27 inch/30 inch line with 36 inch line along College Drive at 800 South	\$813,000					\$942,490					
SS 6	Replace 820 feet of existing 12 inch pipe with 15 inch pipe along College Drive at 1200 South	\$249,000									\$324,889	
WRF 1	Replace screen washer	\$100,000		\$106,090								
WRF 2	Expand aeration basin in headworks	\$400,000					\$463,710					
WRF 3	Replace grit washer	\$200,000		\$212,180								
WRF 4	Third press in solids handling	\$500,000					\$579,637					
WRF 5	Struvite elimination	\$1,600,000		\$1,697,440								
WRF 6	Concrete/membrane existing lagoons	\$500,000					\$579,637					
WRF 7	Replace back-up generator	\$500,000					\$579,637					
M 1	Frequent maintenance related projects	\$5,996,000	\$617,588	\$1,908,347			\$2,085,302			\$759,555	\$782,342	\$805,812
M 2	675 N. 1060 W. to 1200 W. - H2S Concern	\$55,000		\$58,350								
M 3	1720 S. 400 W. to Sand Hill Road - H2S Concern	\$60,000		\$63,654								
M 4	Eastwood Street - Replacement Project	\$200,000						\$238,810				
M 5	Westwood Street - Replacement Project	\$250,000							\$307,468			
M 6	H2S Rehabilitation Program	\$14,665,000	\$500,000	\$518,448	\$2,000,000	\$2,000,000	\$2,987,871	\$1,900,000	\$1,900,000	\$1,900,000	\$1,900,000	\$1,900,000
System Replacement	Replace system as needed	\$14,786,000	\$398,000	\$424,785	\$956,959	\$1,755,980	\$850,825	\$2,213,805	\$2,662,862	\$2,654,064	\$2,760,746	\$3,516,580
Repairs	Unplanned repair fund	\$750,000	\$77,250	\$79,568	\$81,955	\$84,413	\$86,946	\$89,554	\$92,241	\$95,008	\$97,858	\$100,794
Fleet Replacement	Fleet maintenance and replacement	\$3,666,000	\$746,980	\$504,780	\$464,748	\$410,469	\$360,272	\$332,064	\$342,026	\$348,271	\$347,335	\$358,318
	<b>TOTAL</b>	<b>\$48,796,000</b>	<b>\$2,339,818</b>	<b>\$7,243,497</b>	<b>\$3,503,661</b>	<b>\$4,250,862</b>	<b>\$11,756,043</b>	<b>\$4,774,233</b>	<b>\$5,304,597</b>	<b>\$5,756,898</b>	<b>\$6,213,169</b>	<b>\$6,681,504</b>

Figure 7-7  
Recommended Sewer Fund Expenditures, Scenario 4 - With Bonding



# PROPOSED PROJECT COSTS

- Collection System Capacity Improvements
  - \$4.6 million
- Orem Water Reclamation Facility
  - \$3.8 million
- Maintenance
  - Routine Maintenance Areas
  - H<sub>2</sub>S Program
  - \$21.2 million
- Fleet Replacement
  - \$3.7 million
- Miscellaneous Repairs
  - \$ 0.75 million
- System Replacement/Renewal
  - \$14.8
- **TOTAL: \$49 million**

*Present Value*



# HOW IS THE SEWER UTILITY FUNDED?

## ■ Sewer Base Rate Fee

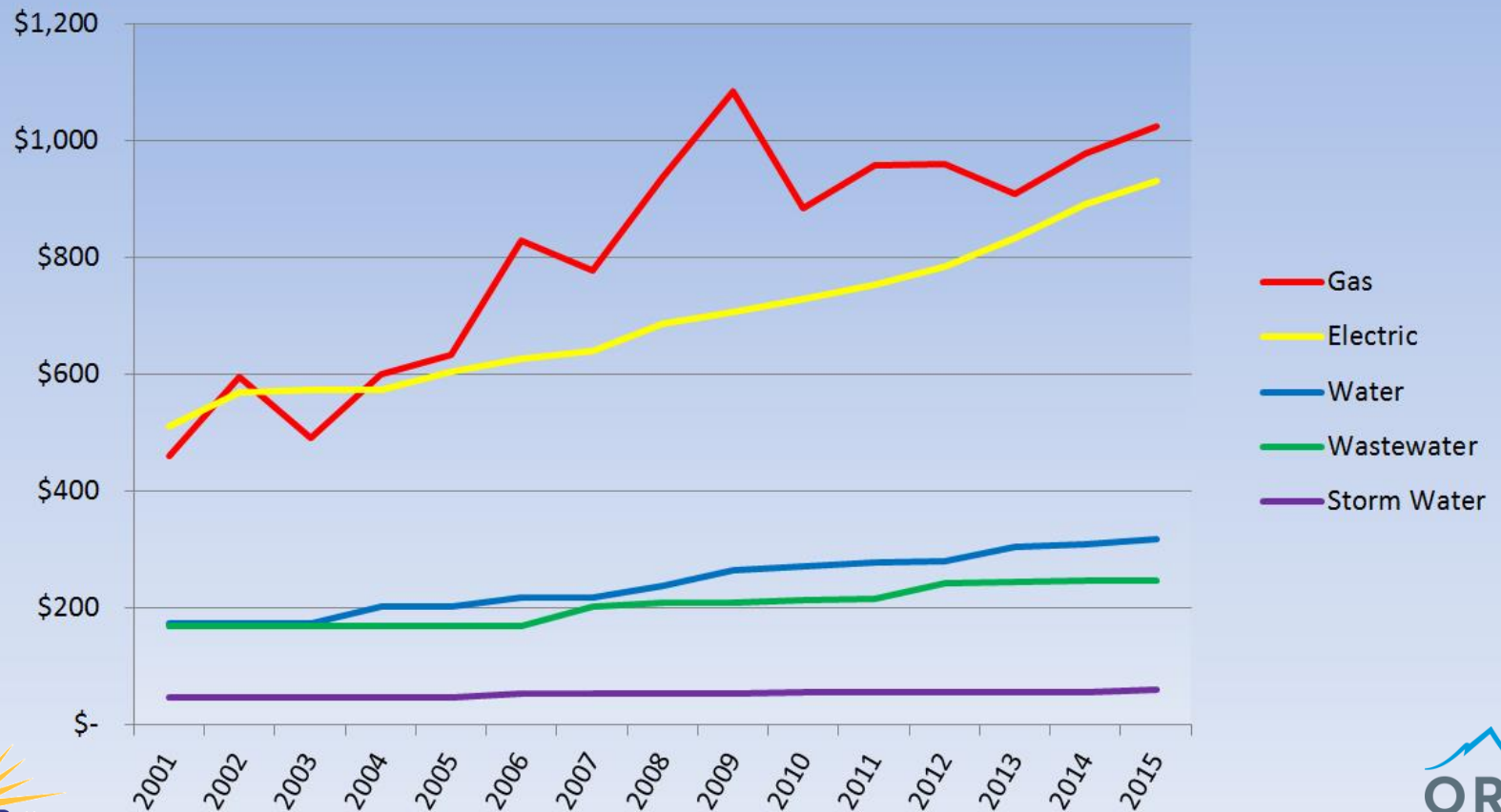
- Billing method change January 2016
  - \$9.32/\$8.32
- No Recommended Change for FY2017
- No Recommended Change for FY2018

## ■ Sewer Volume Charge

- Per 1,000 gallons of average monthly winter water use billed the same for one continuous year from July – June.
  - Adjusted Annually
- Currently \$1.42/1,000 gallons
- No Recommended Change for FY2017

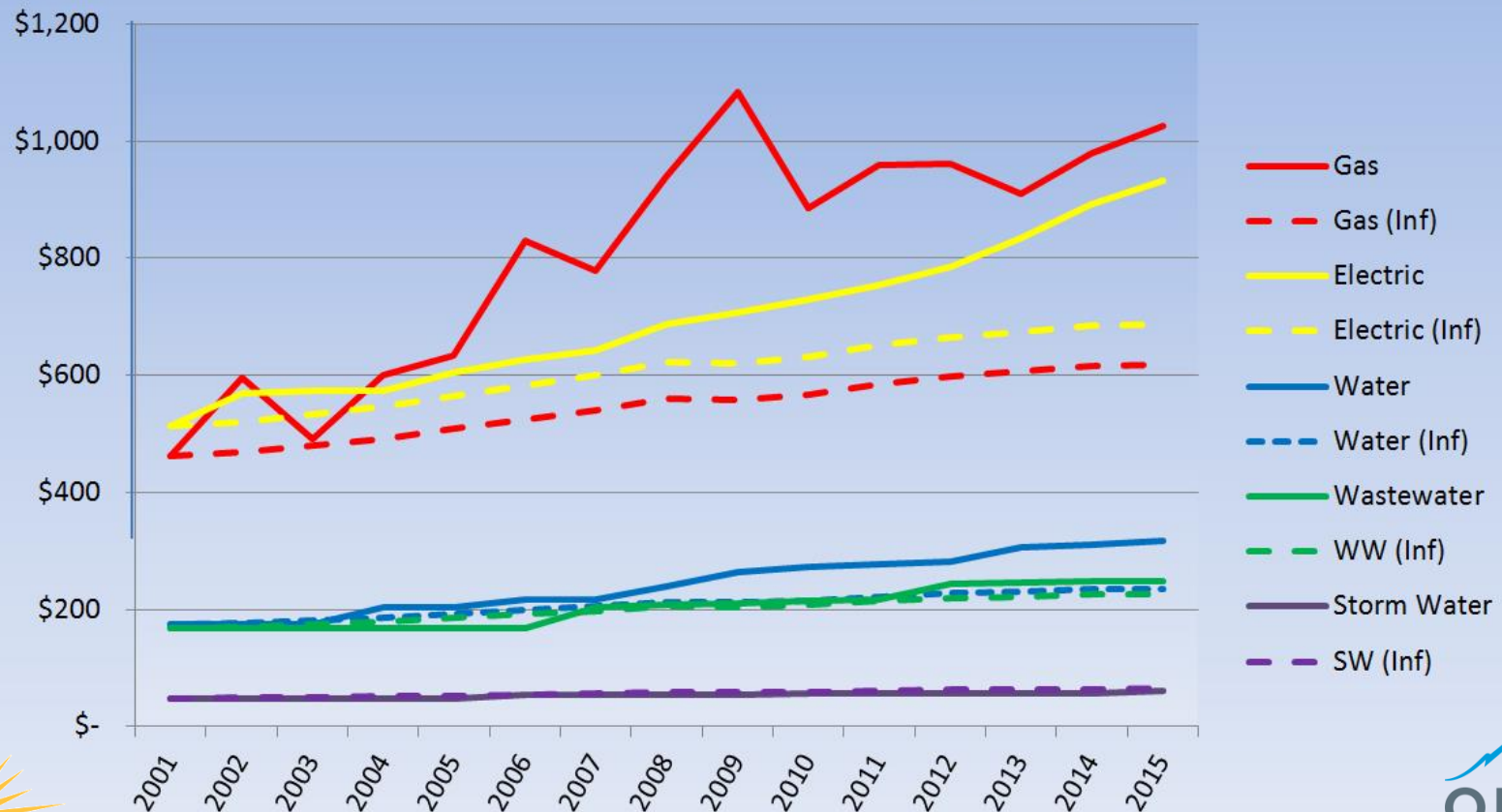
# SEWER UTILITY RATES

Average Annual Cost of Household Utilities



# SEWER UTILITY RATES

Average Annual Cost of Household Utilities  
(with inflation)





# SEWER RATE OPTIONS

Scenario 1: 5-Year					
Year	Base Rate	Production Rate	Montly Increase per SFH	Cumulative Monthly Increase	Total CIP
2016	\$9.32	\$1.42	\$0.00	\$0.00	\$1,000,000
2017	\$9.32	\$1.42	\$0.00	\$0.00	\$2,339,818
2018	\$9.32	\$2.13	\$5.68	\$5.68	\$3,808,706
2019	\$10.72	\$2.45	\$3.96	\$9.64	\$4,748,215
2020	\$12.11	\$2.77	\$3.95	\$13.59	\$5,574,372
2021	\$13.44	\$3.07	\$3.73	\$17.32	\$6,435,555
2022	\$14.11	\$3.22	\$1.87	\$19.19	\$6,656,442
2023	\$14.67	\$3.35	\$1.60	\$20.79	\$6,884,902
2024	\$15.11	\$3.45	\$1.24	\$22.03	\$7,121,196
2025	\$15.56	\$3.55	\$1.25	\$23.28	\$7,365,592
2026	\$16.03	\$3.66	\$1.35	\$24.63	\$7,589,560
Effect on CIP	\$0				

# SEWER RATE OPTIONS

Scenario 2: 7-Year					
Year	Base Rate	Production Rate	Montly Increase per SFH	Cumulative Monthly Increase	Total CIP
2016	\$9.32	\$1.42	\$0.00	\$0.00	\$1,000,000
2017	\$9.32	\$1.42	\$0.00	\$0.00	\$2,339,818
2018	\$9.32	\$1.85	\$3.44	\$3.44	\$3,282,893
2019	\$10.72	\$2.18	\$4.04	\$7.48	\$4,170,292
2020	\$12.33	\$2.53	\$4.41	\$11.89	\$5,053,328
2021	\$13.56	\$2.78	\$3.23	\$15.12	\$5,831,885
2022	\$14.37	\$3.00	\$2.57	\$17.69	\$6,357,901
2023	\$14.94	\$3.24	\$2.49	\$20.18	\$6,884,902
2024	\$15.39	\$3.40	\$1.73	\$21.91	\$7,121,196
2025	\$15.77	\$3.57	\$1.74	\$23.65	\$7,365,592
2026	\$16.03	\$3.66	\$0.98	\$24.63	\$7,586,560
Effect on CIP		\$2,527,838			

# SEWER RATE OPTIONS

Scenario 3: 10-Year					
Year	Base Rate	Production Rate	Montly Increase per SFH	Cumulative Monthly Increase	Total CIP
2016	\$9.32	\$1.42	\$0.00	\$0.00	\$1,000,000
2017	\$9.32	\$1.42	\$0.00	\$0.00	\$2,339,818
2018	\$9.32	\$1.85	\$3.44	\$3.44	\$3,082,893
2019	\$10.44	\$2.07	\$2.88	\$6.32	\$3,870,292
2020	\$11.69	\$2.32	\$3.25	\$9.57	\$4,653,328
2021	\$12.86	\$2.55	\$3.01	\$12.58	\$5,231,885
2022	\$13.89	\$2.75	\$2.63	\$15.21	\$5,757,901
2023	\$14.72	\$2.97	\$2.59	\$17.80	\$6,271,586
2024	\$15.31	\$3.21	\$2.51	\$20.31	\$6,702,834
2025	\$15.72	\$3.47	\$2.49	\$22.80	\$7,139,571
2026	\$16.03	\$3.66	\$1.83	\$24.63	\$7,586,560
Effect on CIP	\$5,885,836				



# SEWER RATE OPTIONS

Scenario 4: Bonding					
Year	Base Rate	Production Rate	Monthly Increase per SFH	Cumulative Monthly Increase	Total CIP
2016	\$9.32	\$1.42	\$0.00	\$0.00	\$1,000,000
2017	\$9.32	\$1.42	\$0.00	\$0.00	\$2,339,818
2018	\$9.32	\$1.85	\$3.44	\$3.44	<b>\$7,243,498</b>
2019	\$10.25	\$2.07	\$2.69	\$6.13	\$3,503,661
2020	\$11.28	\$2.32	\$3.03	\$9.16	\$4,250,862
2021	\$12.41	\$2.55	\$2.97	\$12.13	<b>\$11,756,043</b>
2022	\$13.40	\$2.75	\$2.59	\$14.72	\$4,774,233
2023	\$14.34	\$2.97	\$2.70	\$17.42	\$5,304,597
2024	\$15.06	\$3.21	\$2.64	\$20.06	\$5,756,898
2025	\$15.59	\$3.47	\$2.61	\$22.67	\$6,213,169
2026	\$16.03	\$3.66	\$1.96	\$24.63	\$6,681,504
Effect on CIP	\$0				

# Sewer

**Increase In Monthly Bill From Prior Year (Bond)**

- **\$2.46 Average**
- **2018 Sewer Bond**
  - **P = \$4.5M**
  - **I = \$2.3M**
  - **AP = \$339K**
- **2021 Sewer Bond**
  - **P = \$7.5M**
  - **Costs = \$3.8M**
  - **AP = \$566k**

5-year	Bond	7-year	10-year	Open House
-	-	-	-	-
\$0.00	\$0.00	\$0.00	\$0.00	\$1.68
\$5.68	\$3.44	\$3.44	\$3.44	\$5.29
\$3.96	\$2.69	\$4.04	\$2.88	\$4.64
\$3.95	\$3.03	\$4.41	\$3.25	\$4.12
\$3.73	\$2.97	\$3.23	\$3.01	\$3.92
\$1.87	\$2.59	\$2.57	\$2.63	\$0.95
\$1.60	\$2.70	\$2.49	\$2.59	\$0.97
\$1.24	\$2.64	\$1.73	\$2.51	\$1.00
\$1.25	\$2.61	\$1.74	\$2.49	\$1.02
\$1.35	\$1.96	\$0.98	\$1.83	\$1.04

# THE PATH FORWARD

- Adopt Sewer Master Plan
- Accept the Sewer User Rate Study
  - Recommend move forward plan – each year approve the plan
- Plans are available online at [utilities.orem.org](http://utilities.orem.org)



# QUESTIONS?

